

# Historical and Projected Land Use Change in Madison County, Alabama

## Background

Huntsville, Alabama has continued to grow steadily since the 1950's and like most major metropolitan areas has exhibited significant urban sprawl. This growth has had a marked effect on the remaining green space in Madison County. Shown below are maps of the spatial distribution of "Developed" and "Undeveloped" land in 1984, 1990 and 2000 as determined from satellite images. These maps are used to quantify changes in land use that lead to a loss of green space. Developed land is characterized as having a high percentage of constructed materials (e.g., asphalt, concrete, buildings, etc.) and includes recreational facilities and small areas of associated lawn and vegetation buffers.

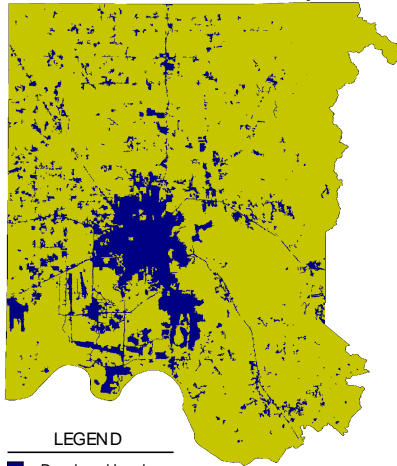
## Instrumentation

These maps were produced using remotely sensed data from Landsat satellites. The 1984 and 1990 maps were produced with data from the Thematic Mapper instrument, whereas the map for 2000 was produced with the newest generation of instrument, the Enhanced Thematic Mapper Plus. Both of these instruments are equipped to detect energy reflected and emitted from Earth's surface in seven discrete wave bands. The spatial resolution of these sensors is 28.5 m (93.5 ft.), which is the size of the picture elements, or pixels, that make up an image. Generally, an object must be several pixels in size to be discernible.

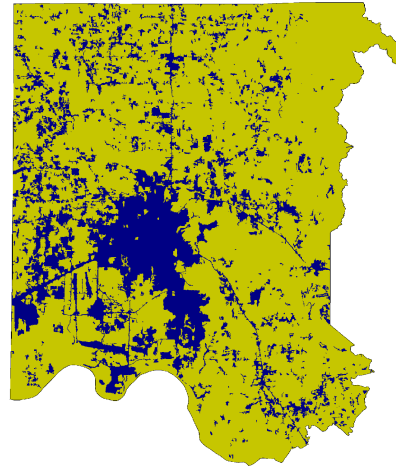
## Results

The upper row of maps shows the spatial distribution of "Developed" and "Undeveloped" land in 1984, 1990 and 2000 whereas the lower maps depict changes that have occurred between image dates. In 1984, Madison County comprised 13% developed land. By 1990, 21% of the land area was developed, and by 2000 the amount of developed land area comprised 30% of the entire county. This is an observed average rate of 1% change in developed land area per year. Projecting this rate of change into the future suggests that as much as 50% of the land in Madison County may be developed by 2020. The last map in the series provides an illustration of what that might look like.

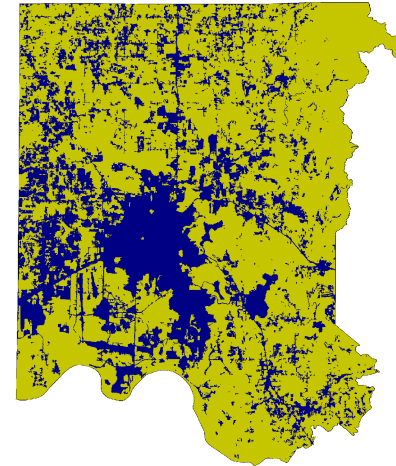
1984 – 13% Developed



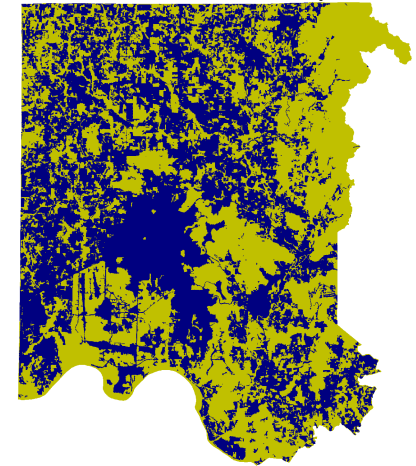
1990 – 21% Developed



2000 – 30% Developed



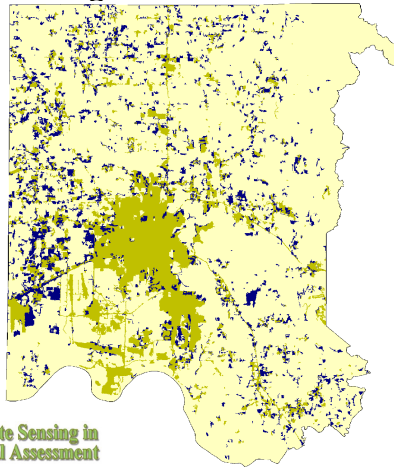
2020 – 50% Developed



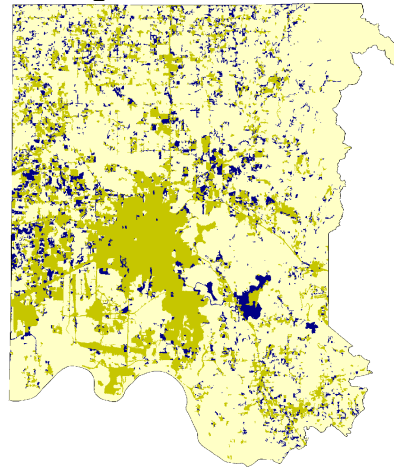
## LEGEND

- Developed Land
- Undeveloped Land

Change: 1984-1990



Change: 1990-2000



| Year | Developed (Hectares) | Undeveloped (Hectares) | Area Total (Hectares) | % Dev | % Chg | % Chg/yr | Total % Chg | Total % Chg/yr |
|------|----------------------|------------------------|-----------------------|-------|-------|----------|-------------|----------------|
| 1984 | 28231                | 182045                 | 210276                | 13    |       |          |             |                |
| 1990 | 44985                | 165292                 | 210276                | 21    | 8     | 1.3      |             |                |
| 2000 | 62070                | 148206                 | 210276                | 30    | 9     | 0.9      | 17.0        | 1.1            |

The observed trend in urban sprawl exhibited in Madison County from 1984 to 2000 can be used to estimate the area of developed land in the future if socio-economic factors remain unchanged. In doing so, it is estimated that by the year 2020, 38% to 50% of the land area of Madison County will be developed. The last map in the series above is an illustration of what the County may look like under these circumstances.

## LEGEND

- Developed Land with No Change
- Undeveloped Land with No Change
- Land that Changed from Undeveloped to Developed

